Responsible Office: OX/Space Network Division

Subject: USE AND REIMBURSEMENT POLICY FOR NON-NASA U.S. GOVERNMENT USERS OF TRACKING AND DATA RELAY SATELLITE SYSTEM (TDRSS)

1. PURPOSE

This Instruction describes NASA policy covering the use and reimbursement for use of the TDRSS by non-NASA U.S. Government users. It is designed to promote efficient use of the system while recovering a pro rata share of the costs arising from operating the TDRSS for other U.S. Government users.

2. APPLICABILITY

This Instruction applies to NASA Headquarters and Field Installations.

*3. SCOPE

This Instruction sets forth the policy governing TDRSS services provided to non-NASA U.S. Government users and the reimbursement for rendering such services. It excludes TDRSS service provided as standard or optional services to Space Transportation System (STS) users under existing policy for Shuttle and Spacelab (14 CFR Subparts 1214.1, 1214.2, and 1214.8), i.e., user command and telemetry support, which utilizes and is a part of the Shuttle or Spacelab communications system, is a Shuttle/Spacelab service. Cooperative missions are also not under the purview of this Instruction. The arrangements for TDRSS services for cooperative missions will be covered in a Memorandum of Understanding (MOU), as a consequence of negotiations between NASA and the other concerned parties. Any MOU which includes provision for any TDRSS service will require signatory concurrence by the Associate Administrator for Space Communications prior to dedicating Office of Space Communications resources for support of a cooperative mission.

*Changed by this revision.

4. BACKGROUND

a. This Instruction establishes an equitable basis for use and reimbursement for use of the TDRSS and service by non-NASA U.S. Government users. The tracking, telemetry, and command services provided by the TDRSS represent a significant growth in the capability of presently available services provided via the ground tracking station network.

b. The TDRSS provides NASA tracking and data relay services. The space segment consists of two satellites in geostationary orbit, with one or more additional satellites in geostationary orbit to be operated as required. The ground segment consists of a single ground terminal and the necessary operational control and interface devices and interconnecting communications circuit services located at White Sands, New Mexico.

5. DEFINITIONS

a. User. Any non-NASA U.S. Government representative or entity who contracts with NASA to use TDRSS services.

b. TDRSS. The TDRSS including Tracking and Data Relay Satellites (TDRS), the White Sands Ground Terminal (WSGT), and the necessary TDRSS operational areas, interface devices and NASA communication circuits to unify the above into a functioning system. It specifically excludes the user ground system/TDRSS interface.

c. Bit Stream. The digital electronic signals acquired by TDRSS from the user craft or the user-generated input commands for transmission to the user craft.

d. Flexible Support. Support requests which permit NASA, at its option, to schedule service at any time during the period of a single orbit of the user mission. Missions requiring multiple support periods during a single orbit may be classified as constrained support.

e. Constrained Support. Support requests which specify the exact times NASA is to provide service, or conditions of support which can be translated into

exact times for service, such as subsatellite positions, apogee/perigee position, etc., for which support is needed.

f. Scheduling Service Period. One scheduled contact utilizing a single TDRS whereby the user, by requesting service, is allotted a block of time for operations between the user satellite and TDRSS.

6. POLICY

a. General. The TDRSS represents a major investment by the U.S. Government with the primary goal of providing improved tracking and data acquisition services to spacecraft in low-earth orbit or to mobile terrestrial users, such as aircraft or balloons. It is the objective of NASA to operate as efficiently as possible with the TDRSS. This is to the mutual benefit of all users. Such user consideration will permit NASA and non-NASA service to be delivered without compromising the mission objectives of any individual user. To encourage users toward achieving efficient TDRSS usage, this reimbursement policy has been established to purposely influence users to operate with TDRSS in the most efficient and orderly manner possible.

b. Services

(1) Standard Services. These are services which the TDRSS is capable of providing to low-earth orbital user spacecraft or other terrestrial users.

(a) Tracking services.

(b) Data acquisition service.

(c) Command transmission service.

(d) Emergency line outage recording in the event of a communications failure between White Sands, Goddard Space Flight Center (GSFC), and Johnson Space Center (JSC).

(e) A weekly user spacecraft orbit determination in NASA standard orbital elements as determined by NASA for TDRSS target acquisition purposes.

(f) Delivery of user data at the NASA Ground Terminal (NGT) located at White Sands.

(g) Prelaunch support for data flow tests and related activities which require use of a TDRS.

(h) Prelaunch support planning and documentation.

(i) Scheduling user services via TDRSS.

(j) Access to tracking data to enable users to perform orbit determination at their option.

(2) Mission-Unique Services. Other tracking and data services desired by the user beyond the standard services and the charges therefor, will be identified and assessed on a case-by-case basis.

c. Apportionment and Assignment of Services. No user may apportion, assign, or otherwise convey to any third party its TDRSS service. Each user may obtain service only through contractual agreement with NASA.

d. Delivery of User Data

(1) As a standard service, NASA will provide to the user its data from the TDRSS as determined by NASA in the form of one or more digital or analog bit streams synchronized to associated clock streams at the NGT.

(2) User data handling requirements beyond the NGT interface will be provided as a standard service to the user, to the extent that the requirements do not exceed NASA's planned standard communications system. Any additional data transport or handling requirements exceeding NASA's capability will be dealt with as a mission-unique service.

(3) No storage of the user data is provided in the standard service. NASA will provide short-term temporary recording of data at White Sands only in the event of a NASA Communications Network (NASCOM) link outage.

(4) NASA will provide TDRSS services on a "reasonable efforts" basis and, accordingly, will not be liable for damages of any kind to the user or third parties for any reason, including but not limited to failure to provide contracted-for services. The price for TDRSS services does not include a contingency or premium for any potential damages. The user will assume any risk of damages or obtain insurance to protect against any risk.

e. User Command and Tracking Data

(1) User command data may enter the TDRSS via the NASCOM interface at one of three locations:

(a) For Shuttle payloads which utilize the Shuttle commanding system, command data must enter the system via JSC and is governed by the policies established for STS services (see par. 4).

(b) For free flyers and other payloads, command data must enter the system at GSFC if it is to be a standard service.

(c) The use of other command data entry points, e.g., the NGT at White Sands, NM, or JSC for payloads using an independent direct link from TDRS to the user payload, is considered to be a mission-unique service.

(2) NASA is required to maintain the user satellite orbital elements to sufficient accuracy to permit the TDRS system to establish and maintain acquisition. This can be accomplished in two ways:

(a) The user can provide the orbital elements in a NASA format to GSFC to meet TDRSS operational requirements.

(b) The user shall ensure that a sufficient quantity of tracking data is received at GSFC to permit the determination of the user satellite orbital elements. The charge for this service will be determined by using the on-orbit service rates.

f. User Data Security. User data security is not provided by the TDRSS. Responsibility for data security resides solely with the user. Users desiring data safeguards shall provide and operate, external to the TDRSS, the necessary equipment or systems to accomplish data security. Any such user provisions must be compatible with data flow through TDRSS and not interfere with other users.

g. Defining User Service Requirements. Potential users should become familiar with TDRSS capabilities and constraints, which are detailed in the TDRSS User's Guide (GSFC document, STDN No. 101.2), as early as possible. This action allows the user to evaluate the tradeoffs available among various TDRSS services, spacecraft design, operations planning, and other significant mission parameters. When these user evaluations have been completed and the user desires to use TDRSS, the user should initiate a request for TDRSS services.

(1) Initial requests for TDRSS service from non-NASA U.S. Government users should be addressed to NASA Headquarters, Code OX, Space Network Division, Washington, DC 20546. Upon review and preliminary acceptance of the service requirements by NASA Headquarters, the appropriate areas of GSFC will be assigned to the project to produce the detailed requirements, plans and documentation necessary for support of the mission. Changes to user requirements shall be made as far in advance as possible and shall be submitted in writing to both NASA Headquarters, Code OX, Space Network Division, and GSFC, Code 501, Greenbelt, Maryland 20771.

(2) Acceptance of user requests for TDRSS service is the sole prerogative of NASA. Although TDRSS represents a significant increase to current support capabilities, service capacity is finite, and services will be provided in accordance with operational priorities established by NASA. Requests for services within priority groups shall be negotiated with non-NASA U.S. Government users on a first-come, first-serve basis for inclusion into the TDRSS mission model.

h. Scheduling User Service

(1) User service shall be scheduled only by NASA. Scheduling refers to that activity occurring after the user has been accepted and placed in the TDRSS mission model as specified in subpar. g(2). See Attachment C for a description of a typical user activity timeline.

(2) Schedule conflicts will be resolved in general by application of principles of priority to user service requirements. Services shall be provided either as normally scheduled service or as emergency/disruptive update service. Priorities will be different for emergency/disruptive updates than for normal services.

(a) Normally scheduled service is service which is planned and ordered under normal operational conditions and is subject to schedule conflict resolution under normal service priorities. Priorities are established by the NASA Administrator or his/her designee. Requests for normally scheduled service must be received by the schedulers at the GSFC Network Control Center no later than 45 minutes prior to the requested support time.

(b) Normal scheduling principles of priority are generally ordered as follows beginning with the highest priority:

(i) Launch, reentry, landing of the STS Shuttle, or other NASA launches.

(ii) NASA payloads/spacecraft.

(iii) Other payloads/spacecraft of interest to the United States.

(iv) Other payloads/spacecraft launched by a NASA launch vehicle.

(v) Other payloads/spacecraft.

(vi) Support of other launches.

Exceptions to these priorities may be determined on a case-by-case basis with the NASA Administrator or his/her designee as the priorities stated above are indicative of general rather than specific cases.

(c) Emergency service conditions are those requiring rapid response to changing user service requirements. Emergency service may be instituted under the following conditions:

(i) Circumstances which pose a threat to the security of the United States.

(ii) Circumstances which threaten human life.

(iii) Circumstances which threaten user mission loss.

(iv) Other circumstances of such a nature which make it necessary to preempt normally scheduled services.

(d) At times, emergency service requirements will override normal schedule priority. Under emergency service conditions, disruptions to scheduled service will occur. As a consequence, users requiring emergency service shall be charged for emergency service at rate factors set forth in Attachment B.

(e) Disruptive updates are scheduled updates which, by virtue of priorities, cause previously scheduled user services to be rescheduled or deleted or are requested by the user less than 45 minutes prior to the scheduled support period.

(i) Disruptive updates will be charged at the same rate as emergency service. User-initiated schedule requests which are received less than 45 minutes prior to the requested schedule support time will be considered a disruptive update.

(ii) User-initiated schedule requests which are received more than 45 minutes prior and less than 12 hours to the scheduled support period will be acted upon as a routine input, provided other users are unaffected. If other users are affected, the scheduling input will be considered a disruptive update and the appropriate charge factor will be applied.

(iii) The Network Control Center (NCC) at GSFC reserves the sole right to schedule, reschedule, or cancel TDRSS service. Schedule changes brought about through no fault of the user are not charged (the factor) for a disruptive update.

(f) While the priority listing remains the general guide for establishing support availability, the NASA schedulers will exercise judgment and endeavor to see that lower priority users are not excluded from a substantial portion of their contracted-for service due to the requirements of higher priority users.

(g) When a user contracts for TDRSS service for an "operational satellite" which interfaces with a significant number of national and worldwide users on a regularly scheduled basis as opposed to an "R&D satellite," NASA will place special emphasis on the operational requirement when planning schedules. This should reduce the probability of losing perishable operational data such as meteorological, climate, or Earth resources information.

(3) General user service requirements, which will be used for preliminary planning and mission modeling, should include, as a minimum, the following:

(a) Date of service initiation.

(b) Expected date of service termination.

(c) The type of TDRSS services desired (e.g., multiple access, tracking, etc.).

(d) The frequency and duration of each service including orbital position or time constraints on service delivery from a given spacecraft where appropriate.

(e) Orbital or trajectory parameters and tracking data requirements.

(f) Spacecraft events affecting tracking, telemetry, or command requirements.

(g) Signal parameters and data rates by type of service, type, and location of antennas and other related information dealing with user tracking, command, and data systems.

(h) Special tests requirements, compatibility testing, data flows, simulations, etc.

(i) Identification of type and quantity of user information necessary for control functions, location of user control facility, and identification of communications requirements.

(j) Identification of ground communication requirements and interface points, including the level of support to be requested from NASCOM.

(4) To provide for effective planning, general service requirements should be provided at least 3 years before initiation of service. With these data, NASA will determine whether the requested services can be provided.

(5) Detailed requirements for user services must be provided 18 months before the initiation of service. These data will be the basis for the technical definition of the Interface Control Document (ICD). If requirements are received late, necessitating extraordinary NASA activities (e.g., overtime, special printing of documents), such activities will be considered to be mission unique and their cost charged to the user.

i. User Cancellation of All Services. The user has the right to terminate its service contract with NASA at any time. A user who exercises this right after contracting for service shall pay the charge agreed upon for services previously rendered and the cost incurred by the Government for support of prelaunch activities, services, and mission documentation not included in that charge. The user will remain responsible for the charges for any services actually provided.

j. User Postponement of Service. The user may postpone the initiation of contracted service (e.g., user launch date) by delivery of written notification to NASA Headquarters, Code OX. If NASA's written approval is not obtained for postponements which delay the contracted start of service date by more than 6 months, the quantity of service to be provided may be affected due to commitments to other support requirements. Therefore, the validity of previous estimates of predicted support availability may no longer be applicable.

k. User/NASA Contractual Arrangement

(1) The NASA Administrator reserves the right to waive any portion of the reimbursement due to NASA under the provisions of this NMI.

(2) When NASA has determined that a potential user has not made sufficient progress toward concluding a contractual arrangement for service, after being placed in the mission model, NASA shall have the unilateral right to remove that user from the mission model.

(3) NASA shall have the right to determine unilaterally that the potential user has failed to make progress toward concluding a contractual arrangement.

l. User Charges. The user shall reimburse NASA the sum of the charges for standard and mission-unique services. Charges will be based on the service rates applicable for the calendar year.

(1) For standard services, the user shall be charged only for services rendered, except that if a total cancellation of service occurs, the users shall be charged in accordance with the provisions of subpar. i.

(a) Standard services which are scheduled, and then cancelled by the user less than 12 hours prior to the start of that scheduled service period, will be charged as if the scheduled service actually occurred.

(b) The time scheduled by the user project shall include the slew time, set up and/or configuration time, TDRS contact time, and all other conditions for which TDRSS services are allocated to the user.

(c) Charges will be accumulated by the minute, based on the computerized schedule/configuration messages which physically set up the TDRSS equipment at the start of a support period and free the equipment for other users at the end of a support period.

(2) The user shall reimburse NASA for the costs of any mission-unique services provided by NASA for the user.

m. Service Rates

*(1) Rates for TDRSS services will be set by the Associate Administrator for Space Communications each October for the following year, January through December. Rate variations will reflect changes in operating costs, loading formulas, and escalation.

(2) Projected estimates will include escalation based on the Bureau of Labor Statistics Index for Compensation per hour - total private.

(3) Attachment A is provided for preliminary planning purposes only. It delineates the rate per minute by service and type of user. These rates are subject to change.

(4) The per-minute charge for TDRSS service is computed by multiplying the charge per minute for

*Changed by this revision.

the appropriate service by the number of minutes scheduled and by the appropriate factor (for flexible, constrained, or disruptive/emergency service).

n. Payment and Billing

(1) The procedure for billing and payment of standard TDRSS services is as follows:

(a) The calendar year is divided into two service periods, January through June and July through December. The charge for TDRSS service will be determined each year for the succeeding calendar year.

(b) Users shall submit a letter of intent, signed by an authorized party, to initiate the process of contracting for TDRSS services.

(c) Users shall adequately fund NASA via valid authorizing documents prior to the initiation of the required services.

(2) Funding schedules for mission-unique services will be mutually developed between NASA and the user on a case-by-case basis, dependent upon the level of engineering effort, long-lead items, special communication services, or other considerations.

7. CANCELLATION

NMI 8410.2A dated March 14, 1991.

/s/Richard H. Truly
Administrator

ATTACHMENTS:
A. Estimated Service Rates in Calendar Year Dollars for TDRSS Standard Services (Based on NASA escalation estimate).
B. Factors Affecting Standard Charges.
C. Typical User Activity Timeline.

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ESTIMATED SERVICE RATES IN CALENDAR YEAR DOLLARS FOR TDRSS STANDARD SERVICES (BASED ON NASA ESCALATION ESTIMATE)

TDRSS user service rates for services rendered in CY-95 based on current projections in 1995 dollars are as follows:

Single Access Service. Whether forward command, return telemetry, or tracking, or any combination of these, the base rate is $130.00 per minute for non-NASA U.S. Government agencies.

Multiple Access Forward Service. Base rate is $30.00 per minute for non-NASA U.S. Government agencies.

Multiple Access Return Service. Base rate is $9.00 per minute for non-NASA U.S. Government agencies.

FACTORS AFFECTING STANDARD CHARGES

Charges for services shall be determined by multiplying the factors below by the base rates for standard services set forth in Attachment A.

	Flexible	Time or Position Constrained	Emergency Service, Disruptive Updates
SINGLE ACCESS SERVICE	.5	1	2

	Flexible	Time or Position Constrained	Emergency Service, Disruptive Updates
MULTIPLE ACCESS FORWARD (COMMAND) SERVICE	.67	1	2

	Normally Scheduled Support	Emergency Service Disruptive Updates
MULTIPLE ACCESS RETURN (TELEM-ETRY) SERVICE	1	2

TYPICAL USER ACTIVITY TIMELINE

TIME (APPROXIMATE)	ACTIVITY
Project conceptualization (At Least 3 years before launch; Ref. par. 6g(1)).	Request NASA Headquarters perform study to determine availability of TDRSS. Placement into mission model if accepted.
3 year before launch (Ref. par. 6h(3) and (4)).	Submit general user requirements to permit preliminary planning. Begin payment for pre-mission activities (Ref. par. N(2)).
18 months before launch (earlier if interfacing is expected).	Provide detailed requirements for technical definition and development of operational documents and ICD's. (Ref. par. h(5)).
3 weeks prior to scheduled support period (SSP).	Submit scheduling request to GSFC covering a weekly period.
2 weeks prior to an SSP.	Receive schedule from GSFC based on principles of priority (par. 6h(2) (b)). Acknowledgement to GSFC required.
Up to 12 hours prior to an SSP.	Can cancel an SSP without charge. (Ref. par. 61 (1) (a)).
Up to 45 minutes prior to an SSP.	Can schedule an SSP if a time slot is available without impacting another user.
Between SSP minus 45 minutes and the SSP.	Schedule requests will be charged at the disruptive update rate (Ref. par. 6h (2) (e)).

Real-Time.	Emergency service requests will be responded to per the priority system (Ref. par. 6h (2) (c) and assessed the emergency service rate.